

## CLAIMS

What is claimed is:

- 5     1.     A circuit board, comprising:
- a section of circuit board material having a signal conductor, a ground conductor, and dielectric material that physically separates the signal conductor and the ground conductor; and
- a signal launch having:
- 10                         a signal via that physically contacts the signal conductor and the dielectric material of the section of circuit board material, and
- a first set of ground vias and a second set of ground vias that physically contact the ground conductor and the dielectric material of the section of circuit board material, wherein each of the first set of ground vias is disposed a first radial distance from the signal via, wherein each of the second set of ground vias is disposed a second radial distance from the signal via, and wherein the first and second radial distances are different.
- 15     2.     The circuit board of claim 1 wherein the signal launch further includes:
- a ground pad, disposed on a surface of the section of circuit board material, the ground pad physically contacting each of the first and second sets of ground vias of the signal launch and the dielectric material of the section of circuit
- 20                         board material.
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| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

3. The circuit board of claim 1 wherein the signal launch further includes:  
a first ground pad, disposed on a first surface of the section of circuit board material, the first ground pad physically contacting each of the first and second sets of ground vias of the signal launch and the dielectric material of the section of circuit board material; and  
a second ground pad, disposed on a second surface of the section of circuit board material that is coplanar with the first surface of the section of circuit board material, the second ground pad physically contacting each of the first and second sets of ground vias of the signal launch and the dielectric material of the section of circuit board material.
4. The circuit board of claim 1 wherein the first radial distance is smaller than the second radial distance such that the first set of ground vias is disposed closer to the signal via than the second set of ground vias, and wherein the signal via has an inner diameter that is smaller than an inner diameter of each of the first set of ground vias.
5. The circuit board of claim 1 wherein the first radial distance is smaller than the second radial distance such that the first set of ground vias is disposed closer to the signal via than the second set of ground vias, and wherein the signal via has an inner diameter that is smaller than an inner diameter of each of the second set of ground vias.
6. The circuit board of claim 1 wherein the first radial distance is smaller than the second radial distance such that the first set of ground vias is disposed closer to the signal via than the second set of ground vias, and wherein each of the first set of ground vias has an inner diameter that is smaller than an inner diameter of each of the second set of ground vias.

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7. The circuit board of claim 1 wherein the signal launch further includes:

a signal pin that electrically connects with the signal conductor of the section of circuit board material through the signal via, the signal pin extending perpendicularly from a plane of the section of circuit board material.

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8. The circuit board of claim 7 wherein the signal pin has a diameter that is less than an inner diameter of the signal via, and wherein the signal pin connects to the signal via through a solder joint.

10 9. The circuit board of claim 7 wherein at least a portion of the signal pin has a diameter that is greater than an inner diameter of the signal via, and wherein the signal pin connects to the signal via in a press-fit manner.

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10. The circuit board of claim 1 wherein the dielectric material of the section of circuit board material separates the first set of ground vias from the signal via by less than 0.082 of an inch.

11. The circuit board of claim 1 wherein each of the first set of ground vias is disposed between the signal via and a respective one of the second set of ground vias.

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12. The circuit board of claim 1 wherein the section of circuit board includes a connecting surface that faces a connector when the connector connects to the signal launch and a distal surface that faces away from the connector when the connector connects to the signal launch, and wherein the signal conductor of the section of circuit board material connects with the signal via of the signal launch at a point along the signal via that is closer to the distal surface than the connecting surface.

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## 13. A connection system, comprising:

a circuit board that includes (i) a section of circuit board material having a signal conductor, a ground conductor, and dielectric material that physically separates the signal conductor and the ground conductor, and (ii) a signal launch having:

a signal via that physically contacts the signal conductor and the dielectric material of the section of circuit board material, and

a first set of ground vias and a second set of ground vias that physically contact the ground conductor and the dielectric material of the section of circuit board material, wherein each of the first set of ground vias is disposed a first radial distance from the signal via, wherein each of the second set of ground vias is disposed a second radial distance from the signal via, and wherein the first and second radial distances are different; and

a coaxial connector that mounts to the signal launch of the circuit board in order to provide electrical access to the signal and ground conductors of the circuit board.

## 14. The connection system of claim 13 wherein the signal launch of the circuit board further includes:

a ground pad, disposed on a surface of the section of circuit board material, the ground pad physically contacting each of the first and second sets of ground vias of the signal launch and the dielectric material of the section of circuit board material.

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15. The connection system of claim 13 wherein the first radial distance is smaller than the second radial distance such that the first set of ground vias is disposed closer to the signal via than the second set of ground vias, and wherein the signal via has an inner diameter that is smaller than an inner diameter of each of the first set of ground vias.
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16. The connection system of claim 13 wherein the first radial distance is smaller than the second radial distance such that the first set of ground vias is disposed closer to the signal via than the second set of ground vias, and wherein the signal via has an inner diameter that is smaller than an inner diameter of each of the second set of ground vias.
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17. The connection system of claim 13 wherein the first radial distance is smaller than the second radial distance such that the first set of ground vias is disposed closer to the signal via than the second set of ground vias, and wherein each of the first set of ground vias has an inner diameter that is smaller than an inner diameter of each of the second set of ground vias.
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18. The connection system of claim 13 wherein the signal launch further includes:  
a signal pin that electrically connects with the signal conductor of the section of circuit board material through the signal via, the signal pin extending perpendicularly from a plane of the section of circuit board material.
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19. A method for forming a connection between a circuit board and a connector, the method comprising the steps of:

providing a circuit board having a section of circuit board material and a signal launch that includes (i) a signal via, (ii) a first set of ground vias, and (iii) a second set of ground vias, wherein each of the first set of ground vias is disposed a first radial distance from the signal via within the section of circuit board material, wherein each of the second set of ground vias is disposed a second radial distance from the signal via within the section of circuit board material, and wherein the first and second radial distances are different;

aligning a connector over the signal launch of the circuit board; and moving the connector toward the signal launch until the connector makes electrical contact with the signal launch.

20. The method of claim 19 wherein the step of providing the circuit board includes the step of:

mounting a signal pin to the signal via such that the signal pin extends perpendicularly from a plane of the section of circuit board material

21. The method of claim 20 wherein the step of moving the connector toward the signal launch includes the step of inserting an end of the signal pin into a portion of the connector, the portion of the connector having a planar surface that is parallel to the plane of the section of circuit board material when a ground portion of the connector makes electrical contact with the ground vias of the signal launch of the circuit board.

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